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JAMES A. TURNER AND HIS "REMARKS ON THE LINNAEAN ORDERS OF INSECTS."

BY HARRY B. WEISS,

New Brunswick, N. J.

On December 1, 1827, James Aspinall Turner wrote that as the study of entomology was "daily becoming more fashionable," it was his aim to encourage "a first taste for the pursuit" by presenting a manuscript dealing with the bare elementals of the science. This he did in 1828 upon the publication of a book in London, entitled "Remarks on the Linnaean Orders of Insects forming a short and familiar Introduction to the Study of Entomology," a small work, consisting only of forty pages and seven colored plates, all "Drawn on Stone from Nature by Mrs. J. A. Turner," that was written anonymously by "a member of the Manchester Natural History Society," who later proved to be Mr. Turner.

In the preface, the author makes it plain that he is addressing only those who want to begin the study of entomology but who are held back by the technical terms, and starting his remarks in the form of a letter he warns the readers against succumbing to ridicule because of their interest in such small creatures as insects.

The text deals rather briefly and generally with the principal characters of insects, transformations, and the seven orders of Linnaeus, Coleoptera, Hemiptera, Lepidoptera, Neuroptera, Hymenoptera, Diptera and Aptera. The characters of each order are outlined, and specific examples of each are mentioned. At the end there is defense of collecting and killing insects in answer to those who object to entomology as encouraging a "cruel disposition." Accompanying the account of each order there is a colored plate showing an example of the order and a specimen of a plant in flower or in fruit, the arrangementt being such as to make the plate pleasing as well as useful.

Turner, who lived in Manchester, wrote the account when he was about thirty-one, and at that time the study of insects was his favorite branch of natural history. He belonged to the Manchester Natural History Society, which was instituted in 1821. From reading the book one gains the impression that either the writer was somewhat religious or that the references to the "Divine Author" in his narrative were inserted because it was the correct thing to do at that time.

Of the bed bug, which he fails to mention as such, he says, "we may esteem ourselves fortunate if we never come into contact with another disgusting genus, Cimex, or Bug. Since, however, these last-mentioned animals seldom make their appearance in well-regulated houses, they may be considered useful as promoting order and cleanliness in our domestic arrangements, and as a proper punishment for neglect."

He tells of breeding cabbage caterpillars and obtaining parasites and dwells on the "happiness enjoyed under the present system, by which ten caterpillars are brought into being—one to perpetuate its race, and the other nine to

CAN. ENT. VOL. LVIII. PLATE 2.

Upper. Title page of Turner's book and "Cicada Plebia, Common Cicada, Canna Indica, Indian Shot."

Lower. "Hipparchia Galatea, Marbled White Butterfly, Briza Media, Middle Quake Grass" and "Musca Pellucens, Coreopsis Tinctoria."

be the prey of ichneumon flies and birds; but all capable of feeling enjoyment, until it is found necessary to remove them from existence."

Turner was a cotton manufacturer and according to the "Country Families of the United Kingdom (London 1881)" by Edward Walford, he was also at one time Justice of the Peace and Deputy-Lieutenant of Pendlebury House, Lancaster county. From 1857 to 1865 he was the Member of Parliament for Manchester, but apparently was rather inactive. During part of his term of office the Civil War was being fought in the United States, and the blockade of the southern ports cut off the supplies of cotton so necessary to the manufacturing industries of Lancashire. Mills stopped and thousands of people were thrown out of work. Lord Palmerston had early taken steps to facilitate the arrival of cotton from Egypt, India and the west coast of Africa, but this required time and there were practical difficulties connected with the fibre that had to be overcome. By the end of 1862 some 500,000 persons were receiving regular relief. A year later the situation showed much improvement, due to the use of cotton from other sources and to the mill workers going into other trades. A central relief committee operated in Manchester, distributing clothing and food. By April 1863, a total of £2,735,000 had been collected and all distributed but £845,000.

Palmerston, in the House of Commons on July 1, 1862, denounced the manufacturers and said that they could have moderated the suffering of their workers had they chosen to use their stocks of cotton in their mills instead of selling them to foreigners at high prices. Whether Turner was one of the manufacturers who merited this charge or not is unknown. By this time it is likely that his active interest in entomology had waned. Thirty-four years had elapsed since the publication of his book, and there is no record to indicate his interest in insects thereafter. He died September 28, 1867, at the age of seventy, having been born in 1797, and his wife survived him only by about four years.

The accompanying plate shows the title page of Turner's book and some of its illustrations.

DIPTERA COLLECTED BY THE LATE ALLAN CRAWFORD ON WRANGEL ISLAND.*

BY C. H. CURRAN AND C. P. ALEXANDER,

Among the effects of the late Allan Crawford, found when the relief ship reached the island in 1924, were some insects contained in alcohol. The Dipterous insects have been forwarded for determination and there are representatives of five species. Of these only six specimens are sufficiently well preserved to permit of determination, the remainder being so fragmentary as to permit of only a guess as to the genus to which they belong. Dr. C. P. Alexander has been kind enough to report upon the Tipulidae. In addition to the specimens examined by him there are fragments of a small species probably belonging to the Limnophilinae. The specimens determined will be mounted in the usual manner after be-

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

ing hardened in xylol, thus making them more available.

Collections of Arctic Diptera are of unusual interest as many of the species are holarctic and it is in far northern America that palaearctic species are most frequently found. The collection contains representatives of three families of Diptera.

MUSCIDAE (ANTHOMYIDAE auct)

Hylemyia sp.

Two females in poor condition appear to belong to this genus. They are however more robust than usual and rather suggest *Hydrophoria* but the squamae are of approximately the same length. The antennae are missing, there are four posterior dorso-centrals and the wings are conspicuously tinged with yellow, while the thorax and abdomen are unusually free of pollen although this may be due to their immersion in alcohol.

HELOMYZIDAE

Oecothea Halliday

Three species belonging to this genus occur in the Arctic region of America and are separable as follows:

1. Small crossvein with conspicuous dark brown clouding; posterior forceps of ♂ rounded apically; scutellum blackish on basal half or more except laterally ..... *fidelis* n. sp.
   Small crossvein at most inconspicuously clouded; if the posterior forceps are rounded apically the scutellum is only a little darkened basally, mostly yellow ..... 2.
2. Large species; posterior forceps of ♂ broad, transverse apically; scutellum blackish on disc ..... *aristalis* Malloch.
   Smaller, under 4.5 mm., posterior forceps rounded apically; scutellum usually almost all yellow ..... *fenestralis* Fallen.

Oecothea fidelis Curran, n. sp.

Very similar to *fenestralis* but the anterior crossvein is clouded with brown, the small frontal hairs are longer and much coarser, the scutellum is strongly bicolorous, the fused posterior forceps longer. Length 3.5 to 5 mm.

Fig. A.

Oecothea fidelis n. sp. Fig. A. Ventral view of ♂ genitalia; p.f. posterior forceps.

Male. Head reddish, whitish or grayish pollinose, the occiput with three short vertical projections forwards, blackish in ground color; front with a broad brownish stripe on each side of the ocelli which curves inwards to fuse or almost join more than half way from the ocelli to the antennae, leaving a broad pale area surrounding the brown ocellar triangle. Palpi reddish yellow. Antennae reddish, the third segment mostly brown; arista brown, pubescent.

Thorax black in ground color, the humeri, posterior calli largely and the

scutellum on its broad border, yellowish; thorax thick grey or yellowish grey pollinose, the mesonotum with three very broad, irregular darker vittae giving a somewhat mottled appearance. Four dorso-centrals, one presutural, one humeral, two notopleural, one supra-alar, two post-callar and one sternopleural; scutellum with two pairs of strong marginals and numerous short discal hairs.

Legs dark reddish, the femora brownish except the base and broad apex. Middle femora anteriorly with a row of fairly strong bristles for more than half their length, but broadly separated from the apex, near the upper edge and with a row of slightly weaker bristles on the apical half in the middle, the lower row complete and strong, the postero-ventral bristles forming a complete more or less double row.

Wings yellowish tinged, especially towards the base; anterior crossvein with conspicuous brown cloud. Squamae and halteres yellow, the former with white fringe.

Abdomen blackish, densely brownish grey pollinose, the genitalia reddish, from ventral view appearing as in fig. A.

Female. The color is the same but the bristles on the middle femora are weaker.

Holotype— ♂, *Allotype*— ♀, and a paratype of each sex; No. 2341 in the Canadian National Collection.

TIPULIDAE

The collection of Tipulidae consists of a single vial containing three imperfect specimens, one of which is headless and cannot be determined. From its general habitus this latter specimen may pertain to either of the genera *Tipula* or *Prionocera*. The remaining specimens represent the two sexes of an undescribed species of the genus *Tipula* that is characterized herewith.

The writer has recently summarized our knowledge of the crane-flies of the Arctic Region (Report of the Scientific Results of the Norwegian Expedition to Novaya Zemlya, 1921. No. 5. The Crane-flies, pp. 9—15; 1922). To the bibliography of Arctic crane-flies given at that time, the following additional reference and emendations should be given:

Alexander, Charles P.
1923. Diptera of the Pribilof Islands, Alaska. (Tipulidae and Rhyphidae). North American Fauna, 46: 159-169, pls. 10-11.
1924. Report of the Second Norwegian Arctic Expedition in the "Fram," 1898-1902. Norsk Entomol. Tidsskr., 1: 296-297.
Lundstrom, C.
1918. Diptera-Nematocera aus den Arctischen Gegenden Siberiens. Resultats Scientifiques de l'Expedition polaire Russe en 1900-1903, sous la Direction du Baron E. Toll. Section E: Zoologie, vol. 2, Livr. 8: 1-33, pls. 1-2.
Riedel, M. P.
1919. Resultats scientifiques de l'Expedition des freres Kuznecov a l'Ourel Arctique en 1909, sous la direction de H. Backland. Nematocera Polyneura. Mem. Acad. Sci. Russ., (8) 28: 1-10, figs.

Tipula crawfordi Alexander, n. sp.

Belongs to the *cineracea* group; wings whitish subhyaline, with a pale brown pattern; male hypopygium with the outer dististyle cylindrical.

Male.—Length about 10 mm. *Female.*—Length about 15 mm.; wing about 13.5 mm.

Coloration described from alcoholic specimens.

Head and thorax blackish, in dry specimens presumably with a grey pruinosity. Abdomen obscure reddish, with a narrow dark line on either side and a paler, more diffuse dorso-median vitta, more evident in the female; caudal margins of the tergites narrowly ringed with darker; in the male, abdominal segments beyond the fifth passing into brownish black.

Frontal prolongation of the head relatively stout, the nasus entirely lacking, as in the group. Antennae with the scapal segments black, the first segment relatively short and stout; flagellum broken.

Fig. 1

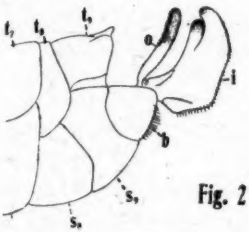


Fig. 2

Tipula crawfordi n. sp. Fig. 1—Ninth tergite, dorsal aspect; Fig. 2—Male hypopygium, lateral aspect; *b*—basistyle; *i*—inner dististyle; *o*—outer dististyle; *s*—sternites 7-9; *t*—tergites 7-9.

Thorax with the dorso-pleural membrane pale. Legs with the coxae and trochanters black, probably pruinose in dry specimens; all of the legs are broken and detached, those presumably pertaining to this species being relatively stout, the femora and tibiae reddish fulvous, the femora broadly, the tibiae more narrowly, tipped with brownish black; tarsi gradually passing into black. Wings detached, but almost certainly pertaining to this species: Whitish subhyaline with a sparse, pale brown pattern, arranged as follows.—A cloud near mid-length of vein Cu_1, occupying cells *M* and *Cu*; a cloud in the outer end of cell *M*, crossing *m-cu* into cell M_4; stigma infuscated; clouds at origin of *Rs* and on the anterior cord, the latter confluent with the stigmal area; wing-apex weakly but extensively infuscated; veins dark brown. Venation: Distal section of vein R_2 pale but entire; cell *1st* M_2 relatively small, pentagonal; cell M_1 longer than its petiole; vein *2nd A* straight.

Apex of the abdomen strongly upturned. Male hypopygium of relatively simple structure. Ninth tergite (Fig. 1) only moderately chitinized, not blackened; caudal margin with a broad and relatively shallow U-shaped notch, the base of the emargination with a second microscopic notch; lateral angles of the tergite broadly truncated, the mesal-apical angle of each a little produced. Basistyle (Fig. 2, b) complete, more reddish in color than the sternite, appearing roughly triangular in outline with the apex evenly rounded. Outer dististyle (o) cylindrical, the distal half blackened, the surface of the style with microscopic pale setae. Inner dististyle (i) a broad, pale yellow, very compressed blade, the caudal margin with a fringe of delicate setae; apex of the style split into two appressed lobes that are blackened, their tips obtusely rounded. Ninth sternite (9s) with a median notch, the base filled with membrane. Eighth sternite (8s) unarmed. Ovipositor with the tergal valves long and slender, the margins smooth. The sternal valves are a little shorter but much deeper, compressed, the tips subobtuse.

Holotype, ♂, Wrangel Island, Siberia (Latitude about 75.1° N.). Collected by Allan Crawford; No. 2342 in the Canadian National Collection.

Allotype, ♀, same data.

The crane-fly is named in honor of the collector, Mr. Allan Crawford, who perished from starvation on Wrangel Island, due to the inability of relief ships to reach him.

Tipula crawfordi belongs to a small group of Arctic *Tipula* that I have called the *cineracea* group, distinguished by the simple male hypopygium and the complete lack of a nasus. The two fully-winged species that agree closest with the present form are *T. cineracea* Coquillett of Alaska (Proc. Washington Acad. Sci., 2: 404; 1900) and *T. katmaiensis* Alexander, of Katmai, Alaska (Ohio Journ. Sci., 20: 202—203; 1920). If the detached wing in the vial actually belongs to the present species, as seems to be the case without any question, the fly is readily told by the pictured wings.* The two subapterous species of the same group, *T. whitneyi* Alexander of the Pribilof Islands, Alaska (North American Fauna, 46: 161-163; 1923) and *T. gynaptera* Alexander from Plover Bay, Siberia (Journ. N.Y. Ent. Soc., 26: 72-73; 1918) are very distinct.

THANAOS JUVENALIS FABR. (LEPIDOPTERA)

BY HENRY MOUSLEY,

Montreal, Que.

In "The Canadian Entomologist" for February, 1923, I had the pleasure of recording the earliest date on record—April 30, 1921—for the capture of *Erora laeta* in the Province of Quebec, as well as announcing the fact of my discovery of the food plant—beech—which was unknown at the time, and of contributing some further facts regarding the life history of the insect. Now, I have the further pleasure of recording what, I believe, to be the first capture of Juvenals Dusky-wing (*Thanaos juvenalis*) in the Province of Quebec. The insect was found frequenting a gully on the northern slope of Mt. Royal, Montreal, on June 16, 1926, and after some fruitless efforts, was at last secured, and later on, presented to the collection of McGill University in the Lyman Entomological Room.

Persistent searching, not only on the date in question, but also, at other times, failed to reveal any further specimens. In Mr. Albert F. Winn's, "A Preliminary List of the Insects of the Province of Quebec," published in 1912, we find no actual records, only a note to the effect, that the species has been taken at Ottawa, and doubtless occurs on both sides of the river. The genus *Thanaos* is a somewhat complicated one, many of the members being so much alike, that exact identification is often difficult, the present species, for instance, being liable to be confused with *T. petronius*, and *T. horatius*, both of which it greatly resembles, although *petronius*. I believe, is now considered to be merely a synonym of *T. horatius*.

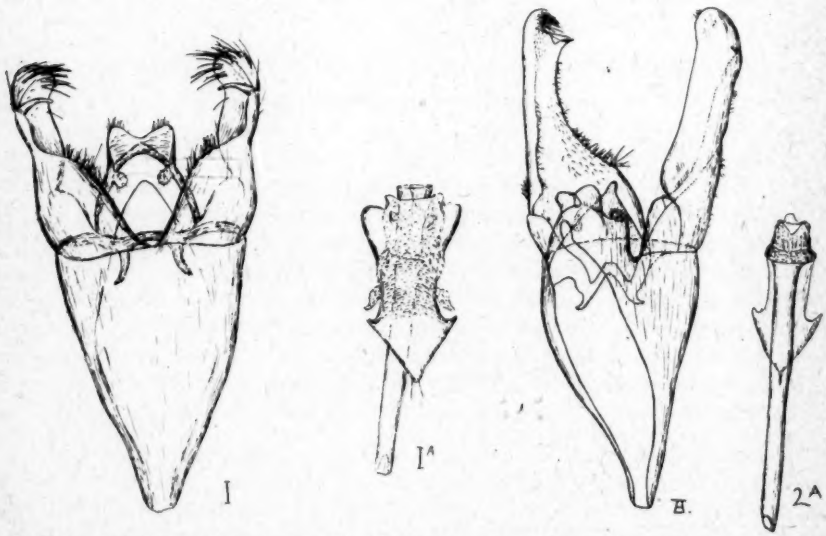
*—Dr. Alexander states that the "fly is readily told by the pictured wings," if the wing belongs with the specimen. The wing does belong as it was loosely attached to the ♂ when received but the transfer of the specimens resulted in its entire separation. The Tipulidae were with the other Diptera when received. C.H.C.

TWO NEW GREYAS FROM BRITISH COLUMBIA. (LEPIDOPTERA, INCURVARIIDAE)

BY E. H. BLACKMORE,
Victoria, B. C.

Greya augustella sp. nov.

Labial palpi fuscous; maxillary palpi white and fuscous mixed, heavily scaled. Antennae black, basal eighth white scaled. Face whitish; head and thorax fuscous. Forewings shining white with golden brown markings. On the terminal third of the wing is a large golden brown patch reaching from costa to inner margin in the form of a large rounded Y. An irregular, somewhat indistinct, golden brown fascia crosses the middle of wing from costa to inner margin. An elongate brown patch on basal third of costa and another smaller one on basal fourth of dorsum. Cilia on costa and tornus golden brown, on termen white with a golden brown spot below apex and another on middle of termen. Hindwings and cilia greyish fuscous. Abdomen dark brown above, ochreous beneath. Legs dark fuscous, with tarsi of posterior pair light fuscous. Alar expanse 15-17 m.m.



1.—Male genitalia of *Greya augustella* Blackmore. 1A.—Aedoeagus and Anellus of same.
2.—Male genitalia of *Greya punctiferella* var. *speculella* Blackmore. 2A.—Aedoeagus and Anellus of same.

Described from 4 males taken by the author on Vancouver Island.

Holotype:—♂, Quamichan Lake, near Duncan, B. C., May 26th, 1921, in the Canadian National Collection, Ottawa.

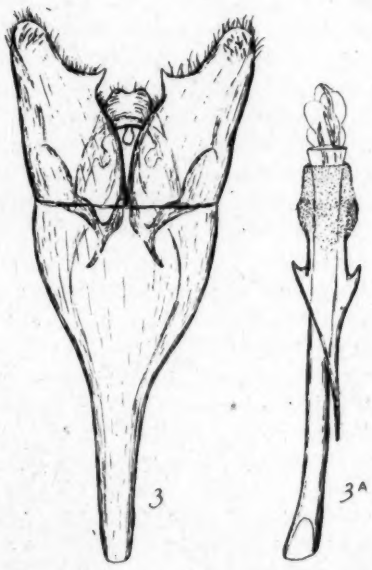
Paratypes:—2 ♂ ♂, same data, one in coll. U. S. Natl. Museum, and one in author's coll.; 1 ♂, Goldstream, B. C., June 2nd, 1921, in collection of author.

I take great pleasure in naming this species after Mr. August Busck, to whom I am deeply indebted for much kindly help, and to whom I owe a great deal of my present knowledge of the micro-lepidoptera.

Greya punctiferella speculella, var. nov.

This new variety is best described by a comparison with the typical form. In *speculella* the spots on the forewings are more numerous as well as being larger and of a darker brown. There is also an elongate spot at the apex of the wing which is wanting in *punctiferella*.

Another and perhaps the chief distinguishing characteristic is in the cilia of the forewing; in *speculella* they are dark brown from the outer costal spot to the apical spot, and are also dark brown on tornus; in *punctiferella* the fringes are all white. In all other respects the two forms are similar, although *speculella* averages slightly more in alar expanse. There is no appreciable difference in the male genitalia.



3.—Male genitalia of *Greya subalba* Braun; 3A.—Aedoeagus and Anellus of same.

Described from 9 ♂ ♂ and 3 ♀ ♀ all taken on Vancouver Island.

Holotype:— ♂, Mt. Tzouhalem, near Duncan, B. C., May 24th, 1921, (E. H. Blackmore) in the Canadian National Collection, Ottawa.

Allotype:— ♀, same data, in author's collection.

Paratypes: 5 ♂ ♂, 1 ♀ same data as above; 1 ♂, Mt. Newton, near Saanichton, B. C., May 24th, 1922, (J. G. Colville); 2 ♂ ♂ and 1 ♀, Fitzgerald, B. C., June 4th, 1922, (W. R. Carter), distributed in Canadian National collection, U. S. National Museum, Dr. W. Barnes coll. and author's collection.

The typical form *G. punctiferella* Wals. also occurs in Victoria and vicinity, and is a new record for the Province.

In this connection I would also like to record the capture of *Lampronia* (*Incurvaria*) *piperella* Busck from Paradise Valley, B. C., (W. B. Anderson),

Salmon Arm, B. C., (W. R. Buckell) and Kaslo, B. C., (J. W. Cockle). This is also a new record for the Province.

My thanks are due to Mr. August Busck for the drawings of the male genitalia which were made for him by Miss Eleanor Armstrong of the United States Bureau of Entomology. For the sake of comparison I include a figure of the genitalia of *G. subalba* Braun.

NEW CANADIAN EPHEMERIDAE WITH NOTES IV.*

BY J. MCDUNNOUGH,
Ottawa, Ont.

Leptophlebia pallipes Hag.

In the western portion of North America there appear to be several closely allied species belonging to the *pallipes-vaciva* group, characterized in the male sex by hyaline whitish abdominal segments 3-6 with slight black markings, the genitalia showing a narrow rod-like apical portion of the penis with the stimuli attached laterally some distance below the tip and either projecting parallel to the penes or curved up dorsally above these organs.

Very unfortunately the identity of the two species already bearing names, viz. *pallipes* Hagen and *vaciva* Eaton, is still doubtful; the latter species was described from males from Mt. Hood, Oregon, now in the McLachlan Collection and unavailable for study; Eaton's short description of the genitalia is applicable to practically any of the species but I have seen no specimens which show a "transparent white" second abdominal segment and are totally devoid of black maculation, as the description would suggest. Until material from the type locality can be secured for study I am unable to identify this species. In the case of *pallipes* the description was drawn up from a unique female from Truckee, Calif.; I have examined the type in the Museum of Comparative Zoology at Cambridge, Mass., and believe that from a single specimen of this sex it is almost impossible to make a definite determination; correctly associated specimens of both sexes from the type locality will be necessary to solve the problem. I apply the name however, tentatively to a series of specimens captured by myself in the latter part of June, 1926, near Lillooet, in the so-called 'dry-belt' of British Columbia: the nature of the country is such that many Nevada insects occur here. The females match well with Hagen's and Eaton's descriptions; the males possess shiny black thoracic and first abdominal segments: abdominal segment two is semihyaline and largely smoky; segments 3-6 and the anterior portion of 7 are hyaline whitish, the remainder deep chocolate-brown, opaque. Dorsally on the posterior margin of segments 2-6 there is a short black transverse dash, situated in the extreme lateral corner, just above the spiracular line, which frequently shows one or two blackish dots on each segment; ventrally there are the usual brown ganglionic patches. Legs whitish, tinged slightly with pale brown, especially on the fore femora and tibiae; wings hyaline with pale venation; crossveins indistinct, except in the pterostigmatic area, where they are darker, oblique, but scarcely curved, and approximately twelve in number; genitalia with the second joint of the forceps gradually tapering from base to apex; third joint enlarged apically; penes rod-

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

like apically with the lateral stimuli curving upward and inward, their apices nearly meeting in the median line (fig. 1).

In two males from Platte Canyon, Colorado, with the same type of abdominal maculation, the rod-like portions of the penes are shorter and the lateral stimuli longer, curving over to meet beyond the apices of the penes: I imagine these differences may prove to be of racial but scarcely of specific value.

Leptophlebia temporalis n. sp.

Very similar to the preceding but slightly smaller. In the males the dark lateral transverse dashes of abdominal segments 2-6 are generally extended to form obscure dark lines along the entire posterior margins of these segments; the stigmatal dots are also more decided and there are frequently traces of dark geminate medio-dorsal lines. On the ventral side of the stigmatal line is a small black mark in the latero-posterior angle of each pale segment. In the genitalia (fig. 2) the penes are more widely separated apically and the lateral stimuli do not curve upward but lie in the same plane and parallel to the penes; at their base is a distinct small ventral tooth which is lacking in *pallipes*. The females are very close to those of *pallipes* but the femora and tibiae are more heavily shaded with light amber-brown. Length of body, 6 mm.; of forewing 7 mm.

Holotype—♂, Alta Lake, Mons, B.C., June 11 (J. McDunnough); No. 2322 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

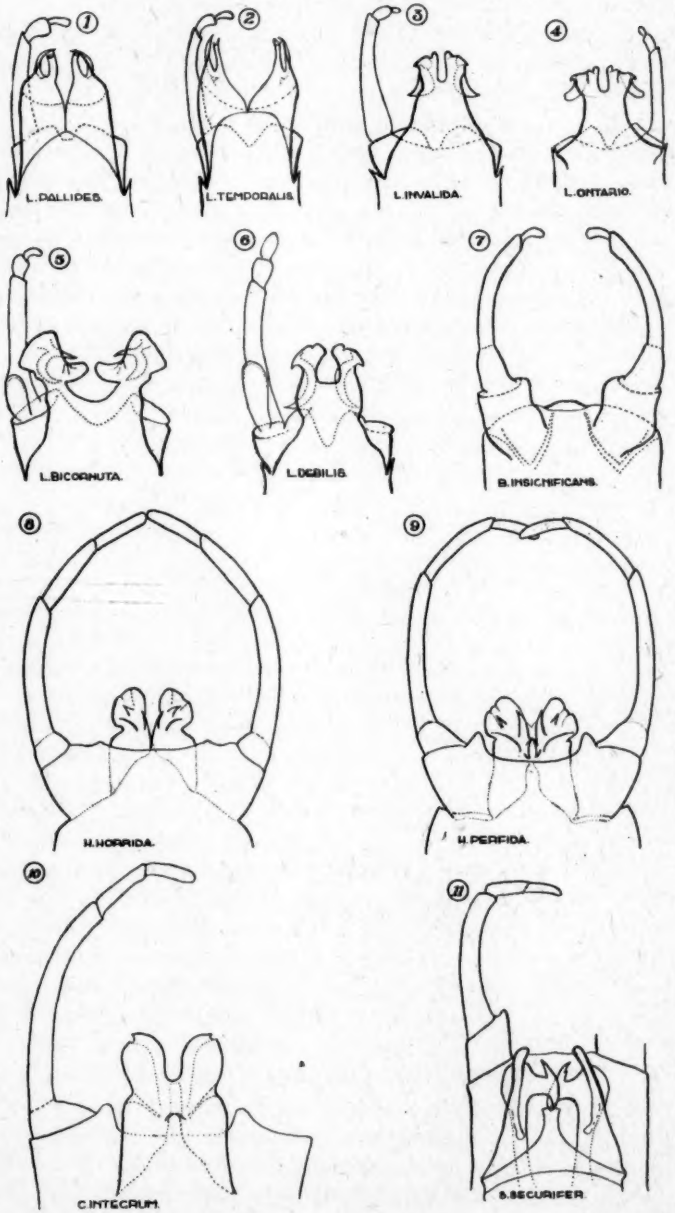
Paratypes—12 ♂, 12 ♀, same data.

I had at first considered this species to be *vaciva* Eaton but the dark second abdominal segment and the black maculation do not tally with the original description.

A second group, occurring in the west, which presents the same difficulties as the above mentioned group, centres around the species *gregalis* Eaton, the types of which were collected on Mt. Hood, Oregon, and are also in the McLachlan collection. I am holding specimens from Santa Clara Co., Calif., under this name at present (vide Can. Ent., LVI, 222) but the identity is doubtful. Recently I have received specimens of a very similar species from Vancouver Island, B. C., which, however, shows differences in male genitalic structure from our Santa Clara species; this may be the true *gregalis* but as Eaton's description of the genitalia is not full enough to be of much service and as further the crossveins of the pterostigmatic region are stated to be irregular and sometimes sparsely branched and anastomosing, which is not the case in the Vancouver Island species, I am treating the species as undescribed. I might also note that *gregalis* female has apparently hyaline white wings, whereas the present species shows a distinct pale amber-colored tinge on the wings.

Leptophlebia invalida n. sp.

Male. Thorax and abdomen deep brown, the median segments of the latter very narrowly paler on the anterior margin; forceps pale brown; setae whitish with faint ruddy banding on basal segments; legs light brown, tarsi somewhat paler. Wings hyaline with the veins faintly brownish; the crossveins are pale and indistinct except in the pterostigmatic region where they are brown, evenly oblique, and about ten in number.



CANADIAN EPHEMERIDAE

Female. (abdomen missing). Very similar to male in color of thorax and legs. Wings tinted with light amber; crossveins also light brown, 14 present in the pterostigmatic space. Length of body 6 mm.; of forewings 7 mm.

Holotype—♂, Departure Bay, B. C., June 23; No. 2323 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratype—1 ♂, same locality, June 11.

I figure the male genitalia (fig. 3).

Leptophlebia ontario n. sp.

Very similar to the preceding species but with much shorter forelegs in both sexes, the femora and tarsi being most noticeable in this respect; in the male genitalia (fig. 4) the shape of the ribbon-like stimuli of the penes is different. The female shows no trace of pale amber suffusion on the wings, these being pure hyaline with pale crossveins as in the male.

A very long series of this eastern representative of the group was taken by Mr. G. S. Walley in the vicinity of Jordan, Ont., in the spring of 1926.

Holotype—♂, Jordan, Ont., June 28, (G. S. Walley); No. 2348 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—17 ♂, 18 ♀, same locality, June 21, 25, 28; 3 ♂, 2 ♀, Balls Falls, Ont., June 28, 29.

Leptophlebia bicornuta n. sp.

Male. Very similar to *debilis* Wlk. Head and thorax deep black-brown. First abdominal segment black-brown; segments 2-7 semihyaline, 2 and 3 almost entirely smoky brown, 4-7 tinged with this color on posterior two-thirds of each segment, 7-10 opaque, brown; a series of lateral black dashes, based on the posterior margin of each segment and not attaining anterior margin, traces dorsally of median and subdorsal dark streaks often more evident on segments 8 and 9. Legs light brown. Forceps with the same basal enlargement of joint 2 as in *debilis;* the penes (fig. 5) with dorsal inward projections apically and with each stimulus bifid. Wings hyaline with light brown venation and pale crossveins except those of the pterostigmatic region which are dark and 12-14 in number. Length of body 9 mm.; of forewing 10 mm.

Female. Abdomen entirely brown, paler posteriorly; head clay-brown tinged considerably at times with ruddy brown; subanal plate with V-shaped excavation of moderate size; legs deep brown; wings hyaline, crossveins of primaries tinged with brown.

Holotype—♂, Bearberry Creek, near Sondre, Alta., Aug. 10, (C. H. Young); No. 2324 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—11 ♂, 16 ♀, same data, also Aug. 21, 24.

There is also a single specimen before me from Shawnigan Lake, Vancouver Island, B. C. As the entire genitalia of *debilis* Wlk. (*separata* Uhl.) have never been figured, I offer a drawing of these parts (fig. 6) for the sake of comparison.

Ephemerella semiflava n. sp.

Male. Head yellowish, tinged with ruddy brown in the region of the ocelli; eyes (living) mustard-yellow; thorax olive-ocherous, shading into light ochreous in the region of the scutellum and tinged with ruddy brown anterior to base of forewing; prothorax with blackish transverse streak near hind margin; pleura and sternum light yellow brown with an oblique streak of pure yellow from base of forewing to base of anterior legs; abdomen olive-ochreous with lateral rows of indistinct brown oblique stripes, more or less fused on segments 8-10; a faint blackish posterior margin to segments 2 and 3 dorsally. Setae white, slightly brown-ringed at base; legs light yellowish, shading into whitish on anterior tarsi; fore tibia about one and one half times the femur in length, tarsi about twice the tibia; hind femur and tibia subequal. Wings hyaline with colorless venation. Length of body 7 mm.; of forewing 8 mm.

Holotype— ♂, Tilsonburg, Ont., June 4 (G. S. Walley); No. 2350 in the Canadian National Collection, Ottawa.

The species has the same type of genitalia as *excrucians* Walsh but is much paler in color; the lateral markings on the abdomen seem characteristic. The type is rather teneral and in well-developed specimens it is probably that the color will be somewhat darker.

Baetis insignificans n. sp.

Male. Turbinate eyes (dried) small, rather bright red; thorax deep brown with the pleural sutures and the anterior projection of the metanotum pale creamy; abdomen with segments 2-6 semihyaline, pale, considerably tinged with smoky brown dorsally; segments 7-10 opaque, dorsally light sepia-brown, ventrally whitish; setae white. Forelegs with the femora dull smoky brown, the tibiae and tarsi paler; mid and hind legs pale ochreous with the femora tinged with smoky. Wings hyaline with pale venation; secondaries narrow, leaf-like, with no costal projection and only two veins.

Female. Head ochreous with considerable ruddy shading in the region of the ocelli, this shading continued behind the lateral ocelli in the form of two ruddy bands extending to the vertex; thorax ochreous with traces of ruddy shading on the pleura; abdomen ochreous or greenish (when full of egg masses); legs pale creamy with tinges of smoky on fore femora. Wings hyaline with pale cross-veins; secondaries reduced to a mere thread. Length of body 4 mm.; of forewing 4 mm.

Holotype— ♂, Seton Lake Cr. Lillooet, B. C., June 28, (J. McDunnough): No. 2349 in the Canadian National Collection, Ottawa.

Allotype— ♀, same data.

Paratypes—24 ♂, 1 ♀, same locality, June 27, 28.

The species falls into a group with *dardanus* McD. and *frivolus* McD.; apart from its much smaller size it is separated from the former by the brown tints of the abdomen and the shorter and narrower hind-wings with great reduction in the female. The male genitalia (fig. 7) show a longer and narrower fourth joint of the forceps and a short projecting plate on the posterior margin of segment 9, lacking in *dardanus; frivolus* is a much larger species, darker in color, with a very characteristic, long fourth joint of the forceps.

Siphlonurus securifer n. sp.

Male. Thorax and dorsum of abdomen shiny, deep black-brown, almost unicolorous except for small triangular patches of pale yellowish laterally on anterior margins of abdominal segments. Ventrally the abdomen is pale yellowish with a narrow dark brown median line on each side of which is a small dark dot about the centre of each segment; laterally there is a row of much larger round brown spots, each spot situated near the anterior margin of its respective segment; forceps smoky-brown; setae dull smoky, ringed with brown. Wings hyaline with dark venation. Forelegs dull brown, mid and hind legs paler, more ochre-brown; femur with a narrow dark band near apex, most distinct on two hind pairs of legs; tarsal joints narrowly dark. Length of body 11 mm.; of forewing 11 mm.

Holotype—♂, Joe Lake, Algonquin Park, Ont., July 7, (F. P. Ide); No. 2326 in the Canadian National Collection, Ottawa.

The male genitalia (fig. 11) are quite distinct, and the ventral abdominal markings, combined with the general dark color, should render the species easily recognizable.

Heptagenia perfida n. sp.

Male. Eyes (living) pale bluish white; head yellowish with ruddy tinges and a round black spot below each lateral ocellus, near the margin of the eyes. Thorax dorsally brown with ruddy tinges on the anterior sutures and with the scutellum somewhat paler, laterally and ventrally light yellow with faint ruddy shades at bases of legs. Abdomen dorsally rather deep brown tinged with ruddy in certain lights, a fine pale broken mediodorsal line and small subdorsal lunate marks on each segment, the lateral edges of the dark areas on each segment slightly oblique, leaving a pale yellowish triangle in the postero-lateral corner; ventrally pale yellowish; setae pale, slightly ringed with ruddy brown at base. Fore legs light yellow at base, femora, except base, deep ruddy brown, tibiae smoky yellow with a black apical spot, tarsi smoky; mid and hind legs pale yellowish, femora tinged with ruddy and tibiae with slight ruddy streaks at base. Wings hyaline with fine, pale venation, the costal crossveins indistinct except 12-13 simple straight ones in the apical area. Length of body 7 mm.; of forewing 7 mm.

Holotype—♂, Jordan, Ont., June 28, (G. S. Walley); No.2351 in the Canadian National Collection, Ottawa.

Paratypes—3♂, same locality, June 25, 28; 1♂, Balls Falls, Ont., June 28.

The species is evidently allied to *cruentata* Walsh by the coloring of the forelegs but differs in the pale venation. Walsh's species having dark veins and crossveins. The male genitalia (fig. 8) are quite distinctive and show considerable resemblance to those of *inconspicua* McD.

Heptagenia horrida n. sp.

Male. Very similar to the preceding species. Head light brown, except the extreme front which is yellow; the black spot of *perfida* is present. Thorax light brown dorsally, the color deepening posteriorly in the region of the scutellum; posterior edge of meso- and metanotum blackish; pleura and sternum light ochreous, less yellow than in *perfida*, with brown tinges at base of legs. Abdomen dorsally light brown, paler in the median region and darker laterally but without the yellowish lateral triangles or the pale dorsal streaks of *perfida*, the pos-

terior margin of each segment is ringed with dark brown; ventrally light ochreous. Legs light ochreous, the fore femora strongly and the other femora slightly tinged with ruddy brown on the distal half; wings hyaline with pale veins and crossveins as in *perfida*. Length of body 7 mm.; of forewing 7 mm.

Holotype—♂, St. David's, Ont., June 11, (G. S. Walley); No. 2352 in the Canadian National Collection, Ottawa.

The male genitalia (fig. 9) as compared with those of *perfida* have different shaped stimuli to the penes and the prominent projections of the posterior margin of the ninth sternite are much reduced, to judge by the single specimen available for study.

Heptagenia solitaria McD.

This species was described from a single male from Waterton Lakes, Alta. The receipt this year of a good series of both sexes from Platte Canyon, Colo., makes it possible to note a few additional features of maculation, not visible in the type which proves to be a rather poorly marked specimen. When well-developed, the abdominal maculation consists of a dark dorsal stripe cut by a narrow pale median line and a narrow transverse band of dark color on the posterior margin of each segment from which broad dark subdorsal bands project forward but do not attain the anterior margins of the segments; there is a tendency for the subdorsal and dorsal stripes to coalesce to form either a simple dark shade (as in the type) or to enclose small lunate marks of the paler ground color, such as is so frequently observed in dark-colored Ephemerids. Just beyond the bases of the mid and hind coxae are short black streaks and dorsad of these, in a line with the wing-bases, are further similar streaks; the tip of the trochanter is also black. These black markings are, however, frequently very obscure. The female is very similar to the male in color and maculation; the vertex of the head is largely ruddy-brown. Well-developed subimagoes shows unicolorous smoky wings with the black venation well defined as in the adult; other subimagoes before me, which seem to represent the same species, judging by maculation, show pale venation. As I have noticed the same feature in *marginalis* Banks, I attribute the difference to the age of the individual subimagoes.

Cinygma integrum Eaton.

I was fortunate, whilst on a collecting trip in British Columbia in 1926 in obtaining a small series of this species at Alta Lake, Mons.

This species, the genotype of *Cinygma*, was heretofore unknown to me and after a study of the structural details, especially the male genitalia, I feel doubtful as to whether the other species generally included in the genus are strictly congeneric: I find, however, that *lyriformis* McD., doubtfully described as an *Ecdyonurus*, is a typical *Cinygma* and closely related to *integrum*, differing in the paler abdomen and certain points of the male genitalia. As Eaton's figure of the genitalia of *integrum* is made from a dried specimen and is not very accurate I offer a new figure (fig. 10).

As noted above, the *mimus-par* group may form a new generic concept or possibly be better placed in *Iron* but I am not prepared at the moment to decide the question. It might be noted that *deceptiva* McD., described from specimens without forelegs, is undoubtedly an *Iron*: a further specimen has been received

from Barkerville, B. C., which shows the first tarsal joint of fore legs fully as long as the second.

NOTES AND NEW SPECIES (LEPID., PHALAENIDAE).

BY WM. BARNES AND F. H. BENJAMIN,
Decatur, Illinois.

Porosagrotis orthogonia duae ssp. nov.

difformis Auct. (nec Sm.)
1924, Hill, Bull. S. Calif. Acad. Sci., XXIII, 183, pl. III, 2, *Euxoa*.

A race of *orthogonia* with the ground color much paler and more ochreous than normal, the black markings intensified and strongly contrasting against the paler ground.

Type locality: Round Valley, Inyo Co., Calif., (O. C. Poling).

Holotype—♂, 15-30 Oct. 1921.

Allotype—♀, same date.

Paratypes—10 ♂ 12 ♀ various dates of September and October; also 2 ♂ 2 ♀, 20 Sept. 1922 and 10 Oct., 1922, one pair of each date, received from and returned to Mr. C. A. Hill.

Notes: the Barnes Collection possesses a long series of what appears to be the same subspecies from Reno, Nevada, various dates of August and September.

Mr. Hill's notes would seem to indicate that we had determined the present race as probably *Euxoa difformis*. We made no such determination. The name *duae* is not intended as a nom. nov. for *difformis* Auct. nec Sm., and the bibliography is simply given for its historical interest.

This form is the antonym of *P. orthogonia delorata* Sm. We are unable to decide if topotypical *orthogonia* is *delorata* or if it is like the Colorado race. We have made strong efforts to obtain Nebraska material, but have failed. Mr. Dodge informed us that the type of *orthogonia* was probably returned to his brother and destroyed in a fire, along with the other types in the Dodge Collection. We sent specimens to Mr. Leussler in order to find out if he was collecting the species, or if it was in a quantity of Nebraska material purchased by him. He sent us specimens from Colorado, but did not have the species from any other locality. Economic workers have long been attempting to obtain *orthogonia* from Nebraska, but seem to have failed.

We considered the possibility that Morrison's species might not be the species so determined in collections, and asked Mr. Leussler to send us anything he had from Nebraska which even faintly resembled *orthogonia* of collections. He sent us *Onychagrotis rileyana* as the only possibility known to him, a species we had been considering, but which appears to violate Morrison's description.

Mr. Dodge informed us that within the period of his own collecting in Nebraska the fauna has seemed to change, probably due largely to drought; also that at the time the type of *orthogonia* was captured he was obtaining a number of other Colorado species which in later years were not caught by him.

Agrotis septentrionalis inordita ssp. nov.[1]

Very similar in all maculation and structure to the type series of *incubita* Sm., but differing by the nearly white hind wings in both sexes, with only fus-

1.—*Agrotis* Hbn., Tentamen, type *Phalaena segetum* D. & S. Used in place of *Euxoa* of Hampson.

cous powdering along the outer margin, on the base of the fringe, and on the veins; the usual dark terminal line present.

Holotype— ♂, Stockton, Utah, VII, 21.

Allotype— ♀, Provo, Utah, VIII-24-9.

Paratypes 20 ♂ 27 ♀ from Stockton, Vineyard, Provo, and Deer Creek, Provo Canon, Utah, various dates of August and September; (Tom Spalding).

Notes: this belongs to the *septentrionalis* group, and may be specific. Genitalia of species of this group, and also of the *messoria* group vary within the species to a considerable extent. We cannot say for certain if there are several species in each of these two groups, or if each group really consists of but a single unstable species now subdividing into units which ultimately may give rise to valid species.

Males of *messoria* and allies are easily sorted from males of *septentrionalis* and its allies by the genitalia. The former has the bifurcate "clasper" on the right side with both its arms of similar breadth, the genitalia being nearly symmetrical. The latter has the ventral arm of the bifurcate "clasper" of the right side greatly broadened, the genitalia being asymmetrical. While this character may sound comparative and of little value, the actual difference is so great that by merely removing a few scales with the point of a pin the males can be easily sorted.

According to "cotypes" and a specimen compared with the type, *incubita* would belong to the *septentrionalis* group, the name of doubtful value and presumably correctly listed in the synonymy of *septentrionalis*. But *relaxa* may belong in the *messoria* group. A careful reexamination of type will be necessary to place the name.

All of the named forms heretofore assigned to both groups have the hind wings more or less heavily powdered with fuscous, especially in the females, so that from superficial appearances *inordita* would at once appear specific. Yet we see so little difference between it and *septentrionalis* in genitalia and other structures that we prefer to describe as a subspecies or "race."

Agrotis annulipes oncocnemoides ssp. nov.

Similar to *annulipes* but the ground color much more olive-ochreous tinged with rufous, black powdering less conspicuous, but the black maculation better written and more strongly contrasting against the paler ground color.

Holotype— ♂, Mt. Lowe, Calif., 1 Aug. 26.

Allotype— ♀, same data.

Paratypes, 2 ♂ same data; 1 ♀, Camp Baldy, San Bernardino Mts., Calif., 16-23 July; also 1 ♂, 1 ♀, Mt. Lowe, Calif., I-VIII-23 submitted by Dr. J. McDunnough for determination.

Notes: the Mt. Lowe specimens, except one pair, were given to Dr. Barnes by one of the western collectors during his recent trip to the Pacific Coast, probably either by Mr. Field or Mr. Wright; the Camp Baldy specimen had been sorted out as a "new species" several years ago, and has remained unnamed until this time. The specimens from Dr. McDunnough have been returned.

The present "subspecies" or "species," depending if one be a "splitter" or a "lumper," has very much the same genitalia as Utah and Nevada specimens going in collections as *annulipes*, and which appear to agree well with the unique female Oregon type of that species. The genitalia seem to differ in that while the

entire harpes are about of equal length in both, and the valves are of about the same breadth, the sacculus of the California form is longer and narrower, even before mounting on a slide it is impossible to hold the genitalia in such a position that it appears as wide as in *annulipes*; it is the portion of the sacculus toward the vinculum which is elongated in the California form. The result is a shortening in the length of the valve of the Californian form in order to maintain the same length for the harpes. The valve of the California form is also more truncate at its caudal end than in *annulipes,* its caudo-dorsal angle less rounded, approaching a right angle, its ventro-caudal angle considerably less produced. We cannot say as to the value of these characters. From the standpoint of many workers they would be considered of specific value. From our own experience with genitalic slides in *"Euxoa"* we rather doubt they are specific. We, therefore, prefer to describe as a subspecies or "race."

The habitus of the Californian subspecies, with its bright colors and contrasting maculation is reminiscent of some *Oncocnemis,* like an overgrown pale *fasciata,* the ground color not unlike some pale specimens of *rosea.* In its own genus *pedalis* has nearly the same ground color, the markings are similar to those of *annulipes,* but as intense as in *cincta,* and with the claviform more or less distinctly outlined.

Agrotis latro sp. nov.

Ground color rufous brown heavily dusted with black and gray, the appearance dark and mottled, the ground color sometimes almost completely obscured; basal line present, double, from costa to the region of the basal dash which is obsolescent, sometimes present, sometimes absent; t.a. line double black, only slightly outwardly oblique, waved; orbicular rounded, black outlined, generally as a pale ring with fuscous filling; median shade blackish, diffused, variable, sometimes filling the cell between the stigmata, outwardly oblique from costa, somewhat oblique inwardly from base of reniform which is of ground color surrounded by black and with a central crescent marked by a black outline, the whole spot constricted centrally, its caudal portion marked by the black of the median shade intensified into a spot; claviform outlined by black; median vein and anal vein marked with color ranging from blackish through slate to pale gray; t.p. line black, almost single, its outer portion obsolescent, produced to points which are usually long on the veins, usually more or less bent inwardly opposite the end of the cell, its exact course somewhat variable, usually rounded out past the caudal part of the reniform, but occasionally touching this; s.t. space more or less marked by sagittate black dashes, these sometimes obsolescent, sometimes nearly fused into a band; s.t. line waved, with the suggestion of a very weak w-mark; terminal space usually blackish; a terminal row of black dots; fringe brownish, with darker interline, the interline more or less broken, causing a checkered appearance. Hind wing nearly uniform fuscous brown, scarcely at all paler basally, the veins somewhat darker than the ground, the discocellular darkened into a discal bar; fringe whitish to brown, interrupted by a darker interline. Beneath: dull, brownish-white, more or less suffused with gray and powdered by black, the veins and discal spot darkened, and with a tendency toward a common medial blackish line.

Expanse: ♂, 29-34 mm.; ♀, 30-35 mm.

Type locality: Truckee, Calif. (presumably collected by Miss Ximena McGlashan).

Holotype.— ♂, 16-23 Sept.

Allotype.— ♀, same date.

Paratypes—17 ♂ 45 ♀ various dates, 16-23 Aug. to 24-30 Sept.

Notes: the Barnes Collection possesses a few females from Truckee not made paratypes. A specimen of presumably the same species is labelled "Calgary, Brit Colum.," probably from the Jacob Doll Collection (locality not certain). Another short series of specimens from Monachee Meadows, Tulare Co, Calif., 8000 ft., 8-15 and 16-23 Aug. appear to be probably conspecific.

The present species is peculiar in several respects. Its antennae are scarcely serrate enough in the males for a normal "*Euxoa*," the serrations nearly as in *abnormis*, so named because of its antennae. The male genitalia are also peculiar, the valves being somewhat as in the *detersa* group, whereas superficially the species is not unlike some of the *tessellata* series, rather like the form Smith named *focina*, but the hind wings, especially of the males are much too dark for this group; the wing-shape is not unlike *rufula*.

In reality the species is not very closely allied to any other known to us. It probably should go into the *detersa* series, but the superficial characters used by Smith and Hampson would put it in the *tessellata* series. We place it in this latter position, knowing it to be out of place there, and it can temporarily rest with other poorly placed species such as *atomaris* and *abnormis*.

The series had long been sorted out in the Barnes Collection. One specimen bears a label by Dr. McDunnough, "This is possibly *intrusa* Sm."

A female "cotype" of *intrusa* is in the Barnes Collection labeled by Dr. McDunnough, "Doesn't agree with ♂ type of *intrusa*," and this was placed under *compressipennis*. This "cotype" is presumably the same as the form subsequently named *focina* by Smith, although, judging from Smith's description, it is likely the form he intended calling *intrusa*. Smith's type series of *intrusa* came from "Sierra Nevada. Calif.." Henry Edwards; a locality which usually means the vicinity of Truckee, Calif. Part of his type series of *focina* also came from Truckee, and we possess a long series from that locality. The actual specimen labeled by Smith as type of *intrusa* is in the U. S. National Museum, and is a form more like true *compressipennis*, this latter being a form closely allied to *rufula*, rather than to *perfusca*. In other words, Smith confused at least two rather unrelated species under the name *intrusa* and in so doing managed to confuse the nomenclature of several other species.

Triphaena flavotincta evelynae ssp. nov.[2]

Similar to *flavotincta* but duller, more uniform brown, lacking much of the black powdering of the typical form, the ordinary black fillings in vicinity of cell and claviform largely replaced by dark brown; the transverse maculation less distinct.

Holotype.— ♂, Ketchikan, Alaska, 8-15 July.

Allotype.— ♀, Ramparts, Alaska, 1-7 Aug.

Paratype.—1 ♀, Ramparts, Alaska, 1-7 Aug.

2.—*Triphaena* Ochs., type *Phalaena pronuba* L.; used in place of *Agrotis* of Hampson.

Caradrina astricta elenae ssp. nov.[3]

Similar to *astricta* which is a variable species and approaching some rufous brown specimens of that species but distinguishable by the abundance of pale violaceous suffusion on the fore wing and the definition of the ordinary lines and spots by the same color. Hind wing somewhat paler than in *astricta* and with more or less of a violaceous cast. Fringe of hind wing violaceous pink. Beneath: fuscous brown and gray, more or less tinged with violaceous pink; with markings as in *astricta*.

Holotype.— ♂ Ramparts, Alaska.

Paratype.—1 ♂ same locality. 1-7 Aug.

Notes: another male from Ketchikan, Alaska, appears to be the same subspecies, but its condition is too poor to be certain. Because of the difference in locality we prefer not to make it a type. The present form is much brighter and more contrasty than *astricta*, and is thus the opposite of *subjugata*.

Miodera eureka sp. nov.

Head and thorax mixed white and black, tinged with brownish and ochreous. Primaries: ground color gray white dusted by black and suffused with brownish; ordinary lines and spots much as in *stigmata* except: the median vein (Cu.) and veins 2, 3, 4, and 5 white-marked in the median area; w-mark much longer, not coalescent with, but intersected by the faintly yellow s.t. line; the s.t. pale shade which is produced to form the w-mark separated from the s.t. line by conspicuous sagittate black dashes between veins 1-2, 2-3, 3-4, 4-5, and 5-6.

Expanse: 29-32 mm.

This is a larger and heavier insect than *stigmata*, not approached by any of 60 specimens of typical *stigmata* from various California localities, including two "cotypes" in Collection Barnes. With an entirely different habitus due to the larger and heavier build, greyer color, longer w-mark, and the presence of the sagittate black dashes conspicuously differentiating the s.t. line from the pale shading of the s.t. area. Some specimens of *stigmata* have the s.t. line marked by black, but only as a darker shading in the terminal area and with no conspicuous dashes in the s.t. area.

Holotype.— ♂, Eureka, Utah, 11-28-21.

Paratype.—1 ♂, same locality 111-27.

Scotogramma fieldi sp. nov.

Closely allied to *gatei* Sm. but somewhat paler and a little more ochraceous in color. Markings similar, but basal dash and claviform tending to be smaller and less conspicuous. The most easily seen superficial difference is in the s.t. line which is much less irregular in *fieldi*.

The genitalia of both species are very similar, but the vinculum of *gatei* possesses a long recurved claw absent in *fieldi*.

Expanse: ♂, 29-31 mm.; ♀, 30-31 mm.

Holotype.— ♂, Laguna Beach, Orange Co., Calif.

Allotype.— ♀, same locality.

Paratypes.—4 ♂ 1 ♀ all 15-30 Jan. 1925, O. C. Poling Collector

3.—*Caradrina* Ochs., type *Noctua i-intactum* Hbn.; used in place of *Lycophotia* of Hampson.

Notes: another male, San Diego, Calif., "9-20-09," recently received from Mr. George Field presumably belongs here. It is very slightly more ochraceous than the type series, probably because of its age. We take pleasure in naming the species in honor of our good friend Mr. George Field who has done so much to assist us in our knowledge of Californian material, even to generously donating many paratypes given him by other authors.

Scotogramma fieldi form wrighti nov.

Similar to *fieldi* but more of an ochre-umber shade, less irrorate with black than either *fieldi* or *gatei*, and at first glance appearing to be quite a distinct species. In build it appears somewhat heavier than *fieldi*, but we rather suspect this is variable.

Species in this group appear to run rather close to one another, and the present form may ultimately turn out to be a valid species. As the genitalia presents no essential differences from those of *fieldi* we prefer to describe as a form.

Expanse: ♂, 32-34 mm.

Holotype.—♂, San Diego, Calif., "3-8-19," (W. S. Wright).

Paratype.—1 ♂, without locality or other label.

Notes: the present form has long stood as new in the Barnes Collection, awaiting more material. Receipt of the good series of Laguna specimens from Poling caused us to apply the specific name to that material. Of the present form we also possess a female without data, differing slightly in the usual way of females in the group, by having somewhat darker hind wings, but we do not care to include it in our type series. A third male, presumably the same form, was received from Mr. George Field, labelled "La Jolla, Mar. 1914, VanDuzee." It is not in the best of condition, and with the difference in locality we think best not to include it in the type series. We take pleasure in naming the form in honor of Mr. W. S. Wright who has equaled Mr. Field in his generous donations of paratypes and other material. Both of these workers have most materially assisted us.

Apatela pruni form prunata nov.[4]

Melanic form of the species now going under the name *pruni* in collections. Yellow tuft on thorax present and conspicuous against the darkened vestiture. Primaries dark slate color, the markings as in the typical form; with additional black diffused streaks along median vein and in submedian fold. T.p. line somewhat marked by white contrasting lunules; s.t. line conspicuously marked with contrasting white lunules. Hind wings nearly evenly suffused with fuscous. Beneath: the usual brownish replaced by a fuscous suffusion of greater intensity.

Holotype.—♂, Oak Station, Allegheny Co., Pa., VIII-18-24.

Paratype.—1 ♂, same locality VIII-19-24.

Notes: we are enabled to describe this peculiar melanic through the kindness of Mr. Fred. Marloff, the collector. Through his kindness the Holotype is deposited in the Barnes Collection. The Paratype is being returned. Mr. Marloff

4.—*Apatela* Hbn., Tentamen, type *Phalaena aceris* L., used in place of *Acronycta* of Hampson. For those who may wish to reject the Tentamen we mention that *Triaena* Hbn., ?1816, Zutr., I, ff. 107-108, *tritona* sole species and therefore type may well be the first subsequent synonym. *Acronycta* Treit., adopted by Hampson, is simply an emendation of *Acronicta* Ochs., and both take the same type, *leporina*, designated by Curtis, 1826, Duponchel, 1829, etc.

had labelled the form *"A. haesitata* var.," but both the superficial characters and the male genitalia show it to belong with *pruni*. We have always been much interested in these dark forms of *Apatela* because of a number of similar forms now standing as valid species.

Apatela cassinoi sp. nov.

Similar to *cretata* Sm. but the markings intensified, the ground color similar but more heavily dusted with black scales which form a disconcolorous powdering along the inner and terminal margins. Hind wing white, the terminal black dots larger than in the average *cretata*.

The resemblance is similar to the European *leporina* form *bradyporina*, with the black markings more intensified, and with an additional black dusting in the terminal space and along the inner margin.

We rather suspect that the present species, along with *cretata* and *moesta* may ultimately prove to be subspecies of *leporina*, but we are not yet ready to propose this synonymy. It will be recalled that Dr. Dyar was of the same opinion regarding *moesta*.

We are not at all sure that the European and American forms are exactly the same, a short European series presenting some differences from our American series. It is not at all unlikely that *vulpina* Grt. may be valid for our American "race."

Expanse: 44 mm.

Holotype.— ♂, Jemez Springs, N. Mex. 19 July 1919.

Notes: the specimen was kindly donated some years ago by Mr. Samuel E. Cassino who had it standing as an unnamed form in his collection. We take pleasure in the use of his name for the stem of the specific name.

Apatela longa form **set** nov.

A melanic of the species going in collections as *longa*. The primaries are of a deep color, variable according to light from a brownish-black to a deep slate. The diffused transverse blackish median shade is nearly lost in the darkened ground color, otherwise the markings are as in typical *longa*, even to the long points on the t.p. line, and the trace of bluish-white marking that line. The secondaries are suffused with fuscous. Beneath: much suffused with fuscous.

Holotype.— ♀, Oak Station, Allegheny Co., Pa., unique.

Notes: this is a parallel to *pruni* form *prunata*. We are also indebted to Mr. Marloff for this specimen which he has kindly deposited in the Barnes Collection.

Merolonche atlinensis sp. nov.

Primaries dull powdery mixed gray-black and white. Ordinary maculation obsolescent; the t.a. line faintly indicated; a pale powdering in cell obliterates the orbicular; reniform rather narrow, crescent-shaped, faintly defined by black; a faint claviform-like mark through the submedian fold to the t.p. line, and a similar mark along vein 1; t.p. line obscured above vein 3, and mainly indicated below by its paler filling, strongly dentate; s.t. line practically obsolete, only indicated by a few darker bordering scales; an obscure dark terminal line; fringe mixed blackish and white. Hind wing nearly uniformly fuscous, with no tendency toward a medial paler band; the veins slightly darker; an obsolescent darker terminal line; fringe mixed fuscous and white. Beneath: dull fuscous powdered

with black and white, the secondaries tending to be somewhat paler than the primaries; discal spots present but not well marked.

Expanse: 37 mm.

Holotype.—♀, Atlin, B. C. unique.

Notes: the present species seems closer to *ursina* than to any other species known to us. The wings are broader in proportion to their length, and the eyes smaller and much narrower than any other species known to us. The scales of the thoracic vestiture are quite narrow and very slightly (scarcely at all) bifurcate, not disssimilar to *lupini*, the abdomen is quite densely clothed with overlying hair, and the general appearance is of a densely hairy species.

A NEW SPECIES OF COMANTELLA. (ASILIDAE, DIPTERA).*

BY C. H. CURRAN,
Ottawa, Ont.

Because of the fact that *Cyrtopogon maculosa* Coquillett was named as type of the genus *Comantella* Curran owing to the confusion of two species under one name and the erroneous placing of *Cophura fallei* Back as a synonym of *maculosa* the way has no doubt been prepared for certain argument as regards the fixation of the genotype. Two courses are open:

(1). To consider *C. maculosa* as the genotype of *Comantella*.

(2). To consider *fallei* as the genotype of *Comantella*.

If the first course is followed *Eucyrtopogon* Curran becomes a synonym of *Comantella* Curran while the group of which *fallei* is typical is left without a name. Considering all the facts of the case this proceeding, while conforming with the rules of zoological nomenclature, is quite absurd, for the following reasons: (1) The named genotype does not possess the characters upon which the genus is based; (2) Combinations of names in the genera *Comantella* and *Eucyrtopogon* would all have to be changed and (3) the intention of the author, which is quite evident from the text, would be ignored.

The advisability of following the second course is very evident as no confusion then exists, or can be imagined, other than as regards *Cyrtopogon maculosa* Coquillett, which belongs to the genus *Eucyrtopogon*. Melander has followed this second course and has named *Cophura fallei* Back as the genotype of *Comantella*, although I believe that his determination of *fallei* was erroneous as was mine of both *fallei* Back and *Cyrtopogon maculosa* Coquillett as the specimens upon which the genus was actually based prove to belong to an undescribed species, which is most likely the same as that in Dr. Melander's collection. It is thus seen that there is still confusion regarding the genotype, unless we accept the designation of Melander. In this I can see no objection because *fallei* possesses all the characters called for in the diagnosis of the genus *Comantella*.

Since there has been a great deal of argument concerning the question of whether or not a genotype shall be the species named, even though the genus may be based upon a misidentification, or whether the actual specimens before the author of a genus shall be the genotype it may not be amiss to make a suggestion in this regard. The following procedure might aid in solving this perplexing question: Where a genotype is named and it is later proved that the specimens

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

before the author of a genus have been wrongly identified, the genotype so named shall be considered as such unless the species so named does not possess all the characters enumerated in the generic diagnosis, in which case the specimens studied shall be deemed the genotype if later named, providing another species, agreeing in generic characters as set forth, has not been named as a genotype in the meantime.

TABLE OF SPECIES OF COMANTELLA.

1. Scutellum with more than ten marginal bristles ..... 2.
   Scutellum with only four marginal bristles ..... *cristata* Coq.
2. Both segments of the style together about one-third as long as the long, slender third antennal segment; anterior tarsi with numerous, long, fine, pale hairs ..... *fallei* Back.
   Style over half as long as the shorter, laterally gently convex third antennal segment; anterior tarsi without long, fine hairs ..... *pacifica* n. sp.

Comantella pacifica n. sp.

Comantella maculosa Curran, Can. Ent., lv, 93, 1923. (not *Cyrtopogon maculosa* Coq.).

As this species has been described in detail in the reference cited a description here is unnecessary *Cyrtopogon maculosa* Coq. lacks the curved spur on the apex of the anterior tibia in the type, a female in the United States National Museum, according to Dr. Aldrich who kindly examined the specimen with especial reference to this character. The characters separating this species and *fallei* are quite well marked and the main differences by which the two may be readily distinguished have been given in the key. The types of *C. pacifica* are as follows:

Holotype, ♂, Penticton, B.C., April 4, 1919 (E. R. Buckell), No. 2320 in the Canadian National Collection, Ottawa.

Allotype, ♀, same data.

Paratypes, ♂ ♀, same data; ♂, Vernon, B. C., July 31, 1923, (D. G. Gillespie).

Comantella fallei Back.

Cophura fallei Back, Trans. Amer. Ent. Soc., xxxv, 378, 1909.

No holotype was selected by Back and as it is possible that the two specimens mentioned by him from California do not belong with the Colorado specimens it has been necessary to examine the types in order to definitely determine the species. Two of these have been submitted by Dr. C. P. Gillette and Mr. C. W. Johnson. These I am considering the types, as follows;

Lectoholotype, ♂, Fort Collins, Colorado, March 30, 1900 (Back gives the date as April 30. The 4 has been crossed out and a 3 written beside it but I am assured that this is a type specimen); in the collection of the Colorado Agricultural College.

Lectoallotype, ♀, Denver, Colo., No. 1218 in the Canadian National Collection, Ottawa: (from the collection of Mr. C. W. Johnson).

Two additional types were loaned by the Massachusetts Agricultural College. They are from California and quite like the lectotypes.

The following description is from the types and additional specimens: Black, the third antennal segment long and slender, the sides very slightly concave, the style hardly over one-third as long as the segment; pleura wholly, the mesonotum chiefly rusty brown pollinose, the "mane" widened and dense behind, without any trace of white hairs intermixed; the portion of the pollinose spots reaching forward along the sides of the abdomen is rusty brownish, this color extending almost to the apices of the segments over the sericeous pollen. Length, 10.5 to 11 mm.

Male. The gibbosity occupies practically all the face; mystax dense, black, the tips of some of the hairs whitish. Face silvery pollinose, with a small brownish spot above; front brownish pollinose, the hair blackish; back of the head with whitish hair, the upper part with a large patch of rusty colored pile on either side, more or less connected behind the vertex. Palpi black, with blackish hair. Antennae black, the first segment with whitish hairs which have brownish bases, the bristles of the second segment long, blackish, becoming brownish and then whitish; third antennal segment one and one-half as long as the first two segments combined.

Thorax rusty brown pollinose, the anterior slopes of the mesonotum laterally and fairly broad sub-median vittae, greyish, the latter fused behind the suture. "Mane" black, its hairs very abundant behind, with fine white pile anteriorly, the black hairs intermixed in front of the suture with fine white hairs, very few of which occur behind the suture laterally. Scutellum with short, dense, curly white pile, the marginal bristles black, numerous.

Legs black, with long yellowish white hair and fine bristles, the femora with black hair intermixed on the under surface.

Wings yellowish hyaline, the crossveins and furcations clouded; the branch of the third vein rises at or beyond the apical fourth of the distance between the vein closing the first basal cell and that closing the discal cell.

Abdomen shining black, yellowish white pilose, the bases of the hairs more or less ferruginous. Lateral sixth of each segment sericeous pollinose on the posterior half, the spots rounded or acute inwardly, the lateral margin in front of them, and usually extending over their outer ends, rusty brownish.

Female. Almost identical but the pollen on the sides of the abdominal segments is either much paler brownish or even grayish.

In addition to the types the following specimens are before me: 2 ♂, Medicine Hat, Alta., March 31, 1923, Feb. 27, 1926, (F. S. Carr); 2 ♂ ♀, Crawford, Nebraska, Dec. 1922, (Owen Bryant).

BOOK NOTICE

Insects of Western North America. By E. O. Essig. 1035 pp. with 766 figures. Published by The Macmillan Co., New York. 1926.

As stated in the preface, this work has been compiled to supply the needs of western students of entomology who desire a work more comprehensive than the well-known "Injurious and Beneficial Insects of California" by the same author. It is primarily intended as a manual and text-book for students in colleges and universities and a handbook for county, state and federal entomologists and agriculturists, as well as for foresters, farmers, gardeners and lovers of nature.

It deals with the insects inhabiting the great area west of the Rocky Mountains and north of Mexico and while by no means exhaustive, discusses in a very satisfactory manner all the more important pests and commoner species of this region. There are twenty-eight chapters, each order of insects being dealt with in a separate chapter and the numerous keys to the various families and groups, drawn up according to the latest taxonomic information, should prove very helpful to those wishful of obtaining a comprehensive knowledge of the classification of insects. The work is profusely illustrated, the illustrations supplementing most excellently the wealth of information contained in the text; the author is to be heartily congratulated on his latest contribution to entomology.

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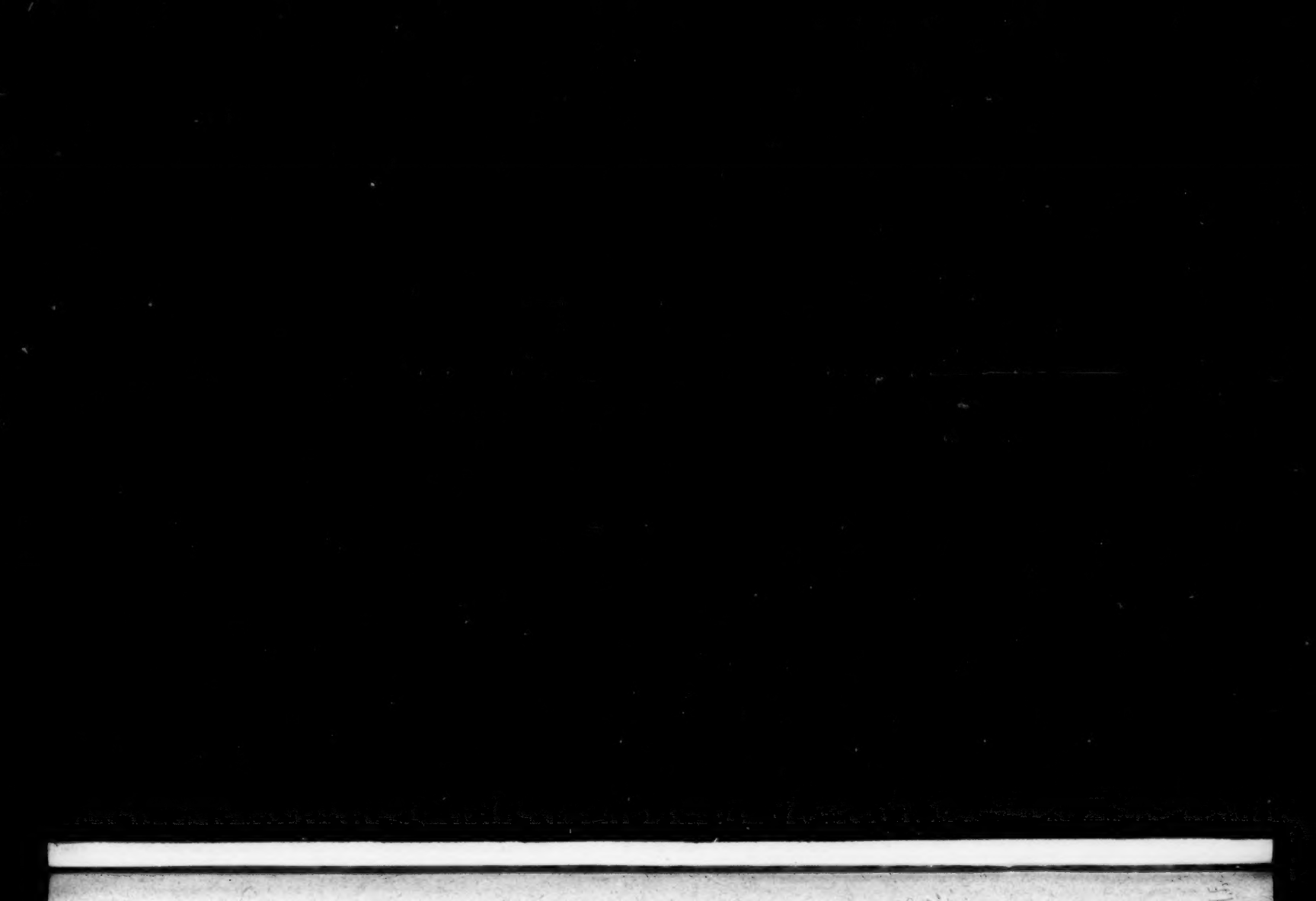
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